

CLAIMS

1 1. An injection device, comprising:
2 a housing having a proximal end and a distal end, the housing defining
3 a distal opening, and
4 a first opening in a side of the housing and between the proximal and distal
5 ends;
6 a propellant disposed inside the housing and spaced from the distal end; and
7 a movable member disposed inside the housing and between the distal end and the
8 propellant,
9 wherein the propellant is in fluid communication with the movable member and the
10 first opening.

1 2. The device of claim 1, wherein the propellant is capable of forming a gas
2 capable of moving the movable member in a distal direction and flowing through the first
3 opening to the exterior of the housing.

1 3. The device of claim 1, wherein the movable member comprises a piston
2 defining a cavity, and the propellant is in fluid communication with the cavity.

1 4. The device of claim 3, wherein the movable member further defines a second
2 opening in fluid communication with the first opening.

1 5. The device of claim 4, further comprising a hollow sleeve configured to mate
2 with the piston, the sleeve defining a second cavity in fluid communication with the
3 propellant.

1 6. The device of claim 5, wherein the sleeve further defines a third opening
2 alignable with the second opening.

1 7. The device of claim 6, wherein the sleeve further defines a groove, and the third
2 opening is disposed in the groove.

1 8. The device of claim 1, further comprising
2 a button at the proximal end of the housing;
3 a battery inside the housing and adjacent to the button;
4 electrical leads in electrical communication with the battery; and
5 a wire in electrical communication with the electrical leads, the wire configured to
6 trigger the propellant.

1 9. The device of claim 1, wherein the distal opening of the housing is configured
2 to mate with a proximal end of a syringe.

1 10. The device of claim 9, wherein the syringe comprises a plunger, and the
2 movable member is configured to move the plunger in a distal direction.

1 11. The device of claim 1, wherein the propellant comprises a chemical pyrotechnic
2 material.

1 12. The device of claim 1, wherein the housing is composed of a plurality of
2 detachable housings.

1 13. The device of claim 1, wherein the device is a needleless injection device.

1 14. An injection device, comprising:
2 a housing having a proximal end and a distal end, the housing defining
3 a distal opening, and
4 a first opening in a side of the housing and between the proximal and distal
5 ends;
6 a propellant disposed inside the housing and spaced from the distal end;
7 a sleeve disposed inside the housing and between the distal end and the propellant,
8 the sleeve defining a second opening and a first cavity, the second opening and the first
9 cavity in fluid communication with the propellant; and
10 a piston mateable with the sleeve and movable in a distal direction, the piston
11 defining a third opening alignable with the second opening,

12 wherein the propellant is in fluid communication with the first opening when the
13 second and third openings are aligned.

1 15. The device of claim 14, wherein the propellant is capable of forming a gas
2 capable of flowing through the first cavity to move the piston, wherein the gas flows through
3 the second and third openings when aligned, and through the first opening.

1 16. The device of claim 14, wherein the piston is coaxial with the sleeve and
2 slidable over the sleeve to align the second and third openings.

1 17. The device of claim 14, wherein the piston defines a plurality of openings
2 alignable with the second opening.

1 18. The device of claim 14, wherein the sleeve defines a groove, the second opening
2 disposed in the groove.

1 19. The device of claim 18, wherein the groove is annular.

1 20. The device of claim 14, wherein the distal opening of the housing is configured
2 to mate with a syringe comprising a plunger, and the piston is configured to move the
3 plunger.

1 21. The device of claim 14, further comprising
2 a button at the proximal end of the housing;
3 a battery inside the housing and adjacent to the button;
4 electrical leads in electrical communication with the battery; and
5 a wire in electrical communication with the electrical leads, the wire configured to
6 trigger the propellant.

1 22. The device of claim 14, wherein the housing further defines an elongate
2 passageway between the first opening and the third opening.

1 23. The device of claim 14, wherein the propellant comprises a chemical
2 pyrotechnic material.

1 24. The device of claim 23, further comprising a filter between the propellant and
2 the first cavity.

1 25. The device of claim 14, wherein the housing is composed of a plurality of
2 detachable housings.

1 26. The device of claim 14, wherein the device is a needleless injection device.